

Clinical Guideline

# MILK RELATED PROBLEMS IN CHILDREN

<b>SETTING</b>	Primary and Secondary Care
<b>FOR STAFF</b>	GPs, Practice Nurses, Health Visitors, School Nurses, Secondary Care Paediatricians
<b>PATIENTS</b>	Children

## Key points:

- Immediate Type 1 allergic reactions - occur within minutes to one hour, are IgE-mediated, and comprise acute urticaria, vomiting, breathing difficulties and rarely collapse. This is dealt with in the (separate) Food Allergy guideline.
- This document deals with the other two common milk-related problems - Lactose intolerance and Cow's Milk Protein intolerance.

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## Definitions

It is important to differentiate between immediate Type 1 allergic reactions to milk and milk 'intolerance'.

Immediate Type 1 reactions are mediated by IgE, occur within minutes to one hour, and usually comprise acute urticaria, vomiting, breathing difficulties and rarely collapse (see separate Food Allergy guideline).

*This guideline deals with the two main types of milk 'intolerance':*

### 1) Lactose intolerance

This is due to lack of lactase in small bowel (temporary or permanent), resulting in inability to digest and absorb lactose in milk (human or animal) or in other dairy products.

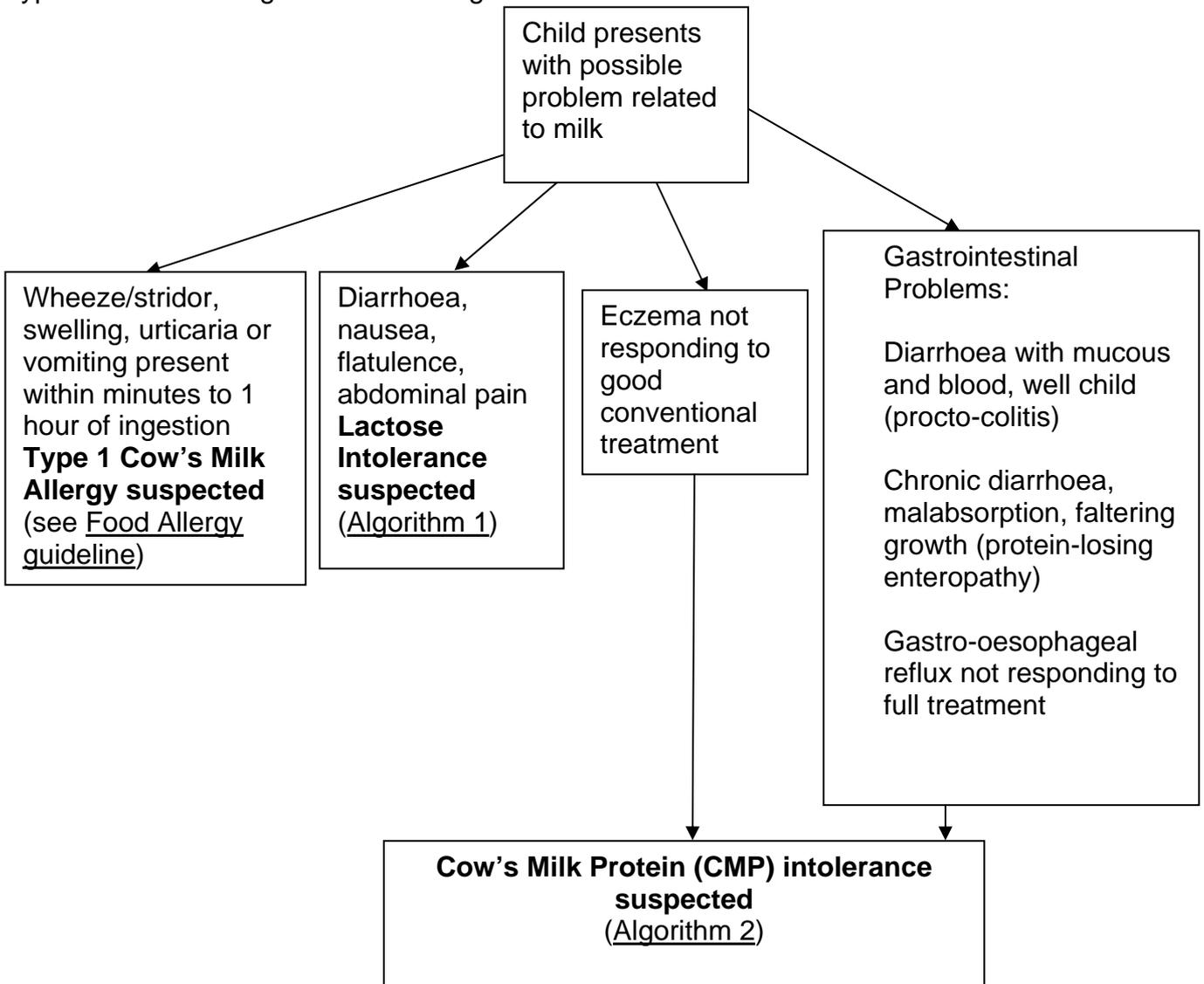
It may be seen transiently following gastro-enteritis.

Variable amounts of dairy products may be tolerated but if tolerance is exceeded, the child may experience flatulence, diarrhoea and abdominal pain.

### 2) Cow's Milk Protein Intolerance or Type 4 hypersensitivity to cow's milk protein (CMP)

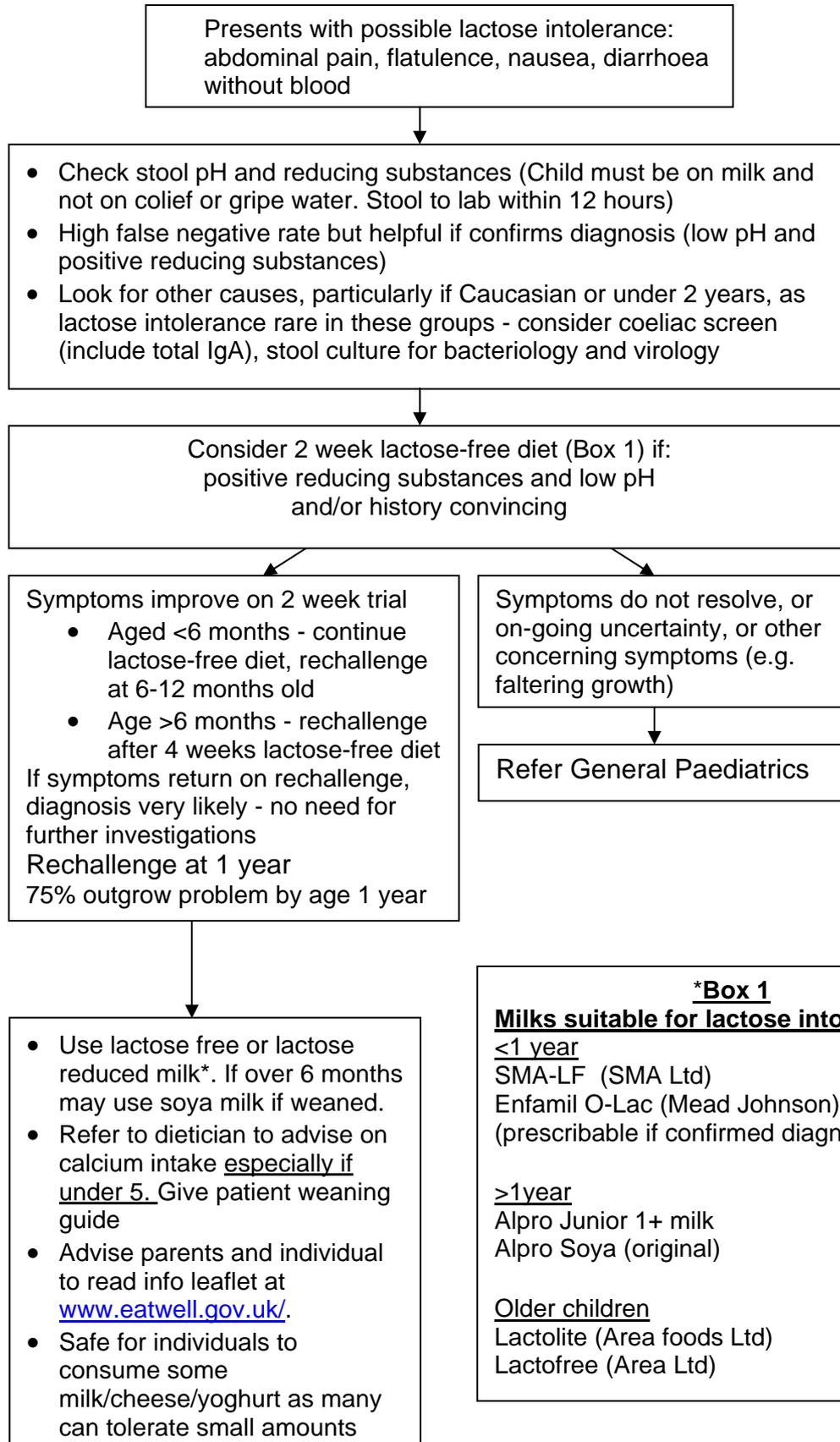
This is due to delayed, *non*-IgE-mediated, hypersensitivity to protein in cow's milk. It has a variable presentation but usually involves skin and gastrointestinal system.

The algorithm below outlines the differences in presentation of cow's milk problems. Click on the hyperlinks for investigation and management of each.



## **Lactose Intolerance (Algorithm 1)**

- Commonly transient following infectious diarrhoea episode
- Common in Afro-Caribbeans and Asians, only 2% of Caucasians
- Often presents in adolescence, unusual before age 2



## **Lactose Intolerance - Background Information**

### **Definition**

Clinical syndrome of one or more of the following:

- abdominal pain,
- diarrhoea
- nausea,
- flatulence and/or bloating

after the ingestion of varying amounts of lactose or lactose containing food substances.

### **Epidemiology**

- 2% of Caucasians, 50-80% in Afro-Caribbean people, almost 100% of Asian people **[1-3]**.
- 20% of Hispanic, Asian and Afro-Caribbean children have evidence of lactase deficiency and lactose malabsorption **[4]**.
- Unusual before the age of 2-3 years and other causes of malabsorption should be sought in these children
- Caucasian children tend to develop symptoms after 4 years of age

### **Clinical Features**

Usually presents slowly and progressively in adolescence or adulthood.

May present acutely if secondary to acute gastroenteritis.

Symptoms include abdominal distension, abdominal cramps and diarrhoea (not vomiting)

Patients often can tolerate small amounts of lactose - see below

### **Pathology**

Lactase is found in the small intestine

Types

- 1) Primary Lactase deficiency - relative or absolute absence of lactase that develops in childhood at various ages in different racial groups
- 2) Secondary lactase deficiency results from small bowel injury such as acute gastroenteritis, small bowel overgrowth or chemotherapy. If diarrhoea persists for more than 14 days after an acute gastroenteritis WHO recommends a trial of avoidance of lactose containing milks. It often can be reintroduced after two weeks **[5]**.
- 3) Congenital lactase deficiency is extremely rare - intractable diarrhoea as soon as human milk or other lactose-containing milk is introduced.

### **Diagnosis**

- Often diagnosed clinically and confirmed by 2 week strict lactose exclusion diet **[6]**.
- Stool pH can be helpful if it is low due to fatty acids produced from bacterial effect on undigested lactose. *Useful if shows acid stool but high false negative.* Undigested lactose may be indicated by reducing substances in the stool (requires liquid stool).

### **Investigations**

- Stool microscopy and culture
- Stool for reducing substances and pH (helpful if positive)
- Coeliac antibodies and total IgA, to exclude coeliac disease

### **Management**

- Lactose-free and lactose-reduced milks for infants are available on prescription and over the counter
- Beyond 1 year children can have lactose free or lactose reduced milk from supermarkets or use soy substitutes.
- **Goats and sheep milk are not free of lactose and are unsuitable cows' milk**

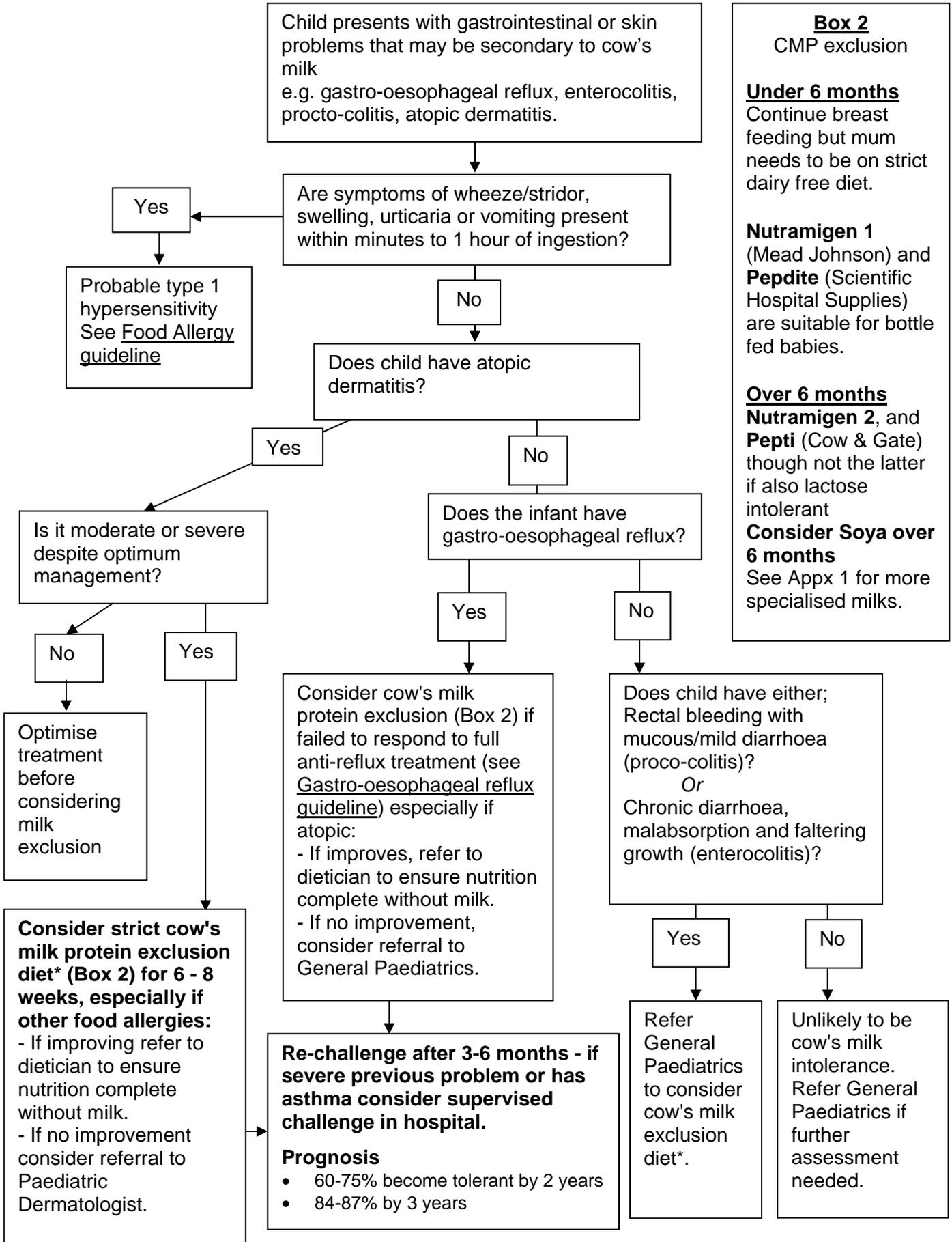
**substitues.**

- Some lactose intolerant individuals may be able to tolerate small amounts of milk and chocolate.
- Yoghurts do still contain some lactose but a lot of the lactose will have been fermented so patients may find that they can tolerate small amounts.
- Cheeses have a far lower lactose content with some cheeses having almost negligible amounts. As such, cheese may be well tolerated in patients with lactose intolerance.

***Individuals presenting with symptoms following cheese ingestion are more likely to have cows' milk protein allergy.***

## Cow's Milk Protein Intolerance (Algorithm 2)

(For special milks see Appendix 1)



**Box 2**  
CMP exclusion

**Under 6 months**  
Continue breast feeding but mum needs to be on strict dairy free diet.

**Nutramigen 1** (Mead Johnson) and **Pepdite** (Scientific Hospital Supplies) are suitable for bottle fed babies.

**Over 6 months**  
**Nutramigen 2**, and **Pepti** (Cow & Gate) though not the latter if also lactose intolerant  
**Consider Soya over 6 months**  
See Appx 1 for more specialised milks.

\*Do not use soya milk before 6 months.  
See Box 2 and Appendix 1 for which milk to use

## **Cow's Milk Protein allergy and 'intolerance' - Background Information**

### **Epidemiology**

- Cows milk protein (CMP) allergy affects 2-3% of children, including 0.5% of purely breast fed infants as CMP from mother's diet may be present in breast milk [7].
- 50% of milk allergy is immediate IgE-mediated Type 1 hypersensitivity (see [Food Allergy guideline](#))
- The other 50% of cases are delayed onset Type 4, non IgE-mediated, reactions - often known as cow's milk protein intolerance, and usually involve the skin and gastro-intestinal (GI) system.

### **Clinical Features**

- Temporal association between symptoms and ingestion of milk
- Several body systems may be involved - skin, gastrointestinal
- Co-existing atopy or family history of atopy common
- Lactose intolerance must be excluded if possible – see above

### **Common presentations in infancy**

- Atopic Dermatitis - moderate to severe disease which is not controlled on optimum treatment *may* be due to CMP intolerance (especially if other food allergy or faltering growth also present)
- Gastro-oesophageal reflux - clear overlap between Gastro-oesophageal reflux disease (GORD) and CMP intolerance. Consider trial of cows milk elimination if other features of atopy or failure to respond to full anti-reflux treatment.
- Other GI symptoms - e.g. diarrhoea with mucous and rectal bleeding (procto-colitis), protein enteropathy (chronic diarrhoea, malabsorption, faltering growth)

### **Investigations**

Consider allergen specific IgE (RAST test) to CMP, although this is likely to be negative in Type 4 hypersensitivity, more likely to be positive in immediate hypersensitivity.

### **Management**

- Consider referral to paediatrician or paediatric dermatologist
- Diagnosis is usually made if complete CMP exclusion ([www.eatwell.gov.uk](http://www.eatwell.gov.uk)) significantly improves symptoms.
- Eczema: NICE [8] states that bottle-fed infants under 6 months with moderate or severe atopic eczema which is not controlled by optimum standard therapy should be prescribed extensively hydrolysed formula milk\* (not soya) for 6-8 weeks. If breast-fed the mother can be advised to exclude all dairy from her diet but it is not known whether altering the mother's diet is effective in reducing the severity of the condition.
- Other presentations of suspected CMP intolerance: prescribe extensively hydrolysed formula for infants under 6 months if bottle-fed, or exclude dairy from mother's diet if breast-fed.
- Soya protein milk can be offered to children **over 6 months** with either condition.
- If the condition improves and dairy exclusion is to be continued, the child should see a dietician to ensure their diet remains nutritionally complete.
- After a period of dairy-free diet, rechallenge should be under specialist guidance if patient has asthma, enterocolitis or severe previous reaction.

### **Prognosis**

60-75% become tolerant by 2 years, 84-87% by 3 years.

## **Appendix 1 - Special milks for Cows Milk Protein Allergy and CMP Intolerance**

### ➤ Under 6 months old

**Nutramigen 1** (Mead Johnson) and **Peptide** (Scientific Hospital Supplies) are suitable. Do not use soya before 6 months of age.

### ➤ Over 6 months old

**Nutramigen 2** contains more hydrolysed protein and calcium in anticipation of the child starting to take less milk as weaning progresses.

**Pepti** (Cow & Gate) may be suitable for infants who present aged over 6 months. It contains lactose which makes it more palatable but makes it unsuitable for infants with co-existing lactose intolerance.

### Additional notes:

Some other hydrolysed formulae such as **MCT Peptide** (SHS), **Pepti Junior** (Cow and Gate) and **Pregestimil** (Mead Johnson), contain higher levels of medium chain triglycerides and as such are less suitable as first line treatment for milk allergy/intolerance.

Allergic reactions to extensively hydrolysed infant formulae are unusual but if they occur the infant should be prescribed an amino-acid formula and be referred to secondary care. Suitable amino-acid based formulae are: **Neocate** (Scientific Hospital Supplies), and **Nutramigen AA** (Mead Johnson).

Soya formula should be avoided under 6 months of age due to high levels of phytoestrogens. It may be used in infants over 6 months once weaning has progressed as the overall phytoestrogen load is reduced. With Soya there is also a risk of protein intolerance which can be present in up to 35% of milk intolerant infants.

### ***Other alternative milks are not recommended***

There is no role for alternative mammalian milks as there is a high incidence of cross-reactivity. Milk substitutes based on grains and legumes, such as oat or almond milk are nutritionally incomplete and should be avoided in children less than 2 years. Rice milk should be avoided in all children following the FAS advice regarding the presence of inorganic arsenic

### **References**

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2. Lloyd ML Olsen WA. Disaccharide malabsorption. In:Haubrich WS, Schaffner F, Berk JE, eds *Bockus Gastroenterology* 5<sup>th</sup> ed. Philadelphia, PA: Saunders; 1995:1087-1100,
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5. World Health Organisation, International Working Group on Persistent Diarrhoea. Evaluation of an algorithm for the treatment of persistent diarrhoea: a multicenter study. *Bull World Health Organ* 1996;74:479-489
6. <http://www.eatwell.gov.uk/healthissues/foodintolerance/foodintolerancetypes/lactoseintol/>
7. Apps J Beattie BMJ Cows milk protein allergy in children 8 August 2009 339 343
8. National Institute of Clinical Excellence. Atopic eczema in children. Management of atopic eczema in children from birth to the age of 12 years December 2007

### **RELATED**

[Food Allergy Management in Children](#)

<http://nww.avon.nhs.uk/dms/download.aspx?did=12188>

### **QUERIES**

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